WORKSHEET 1

CHAPTER 5 – WORK AND ENERGY

A. Tick (✓) the correct option.

1. The SI unit of work is
   a. Newton-metre. b. Newton. c. Joule. d. Watt.
2. Work done in lifting 50 kg through a vertical height of 10 m is equal to
   a. 4900 J. b. 9800 J. c. 0 J. d. none of these.
3. Work done is zero when angle between the direction of force and direction of displacement is
   a. 90°. b. 45°. c. 180°. d. none of these.
4. The energy possessed by a body by virtue of its motion is called
   a. kinetic energy. b. potential energy. c. nuclear energy. d. none of these.
5. Kinetic energy of a body of mass m, moving with a velocity v is given by
   a. mv. b. mv^2. c. $\frac{1}{2}mv$. d. $\frac{1}{2}mv^2$.

B. Fill in the blanks.

1. Work is a _____ quantity.
2. Work done when body moves in the direction of the applied force is _____
3. Energy possessed by a body by virtue of its position or configuration is called _____ energy.
4. The _____ is the ultimate source of all types of energy.
5. Energy can neither be _____ nor be _____

C. State whether the given statements are true or false.

1. Kinetic energy of a moving body is directly proportional to its mass.
2. Power is a vector quantity.
3. SI unit of electrical energy is joule.
4. When the body moves in the direction opposite to the direction of force applied, work done is said to be positive.
5. Rate of doing work by a body is called power.

D. Match the following.

1. Kinetic energy	$F \times s$
2. Work done	constant
3. Potential energy	$\frac{1}{2}mv^2$
4. Power	$\frac{E}{t}$
5. Potential energy + Kinetic energy	mgh

Name: ..... Teacher's signature: .....

Class: IX Date: .....

E. Answer the following questions.

Very Short Answer Questions

1. What is zero work?
2. Define 1 watt.

Short Answer Questions

1. Define kinetic energy.
2. Calculate the work done when a force of 10 N displaces a body by 5 m.

Long Answer Questions

1. What will be the potential energy of a body of mass 2 kg kept at a height 10 m above the ground.
2. Give the relation between SI unit of energy and commercial unit of energy.

ANSWERS

WORKSHEET 1

A. Tick (✓) the correct option.

1. c
2. a
3. a
4. a
5. d

B. Fill in the blanks.

1. scalar
2. positive
3. potential
4. sun
5. created, destroyed.

C. State whether the given statements are true or false.

1. T
2. F
3. T
4. F
5. T

D. Match the following.

1. Kinetic energy — $\frac{1}{2} mv^2$
2. Work done — $F \times s$
3. Potential energy — mgh
4. Power — $\frac{E}{t}$
5. Potential energy + Kinetic energy — constant

E. Answer the following questions.

Very Short Answer Questions

1. When force applied or the displacement is zero or when both are perpendicular to each other, zero work is done.
2. The power of a body is 1 W if it is doing 1 J of work in 1 s.

Short Answer Questions

1. The energy possessed by a body by virtue of its motion is called kinetic energy.
2. Force = 10 N

   Displacement = 5 m

   Work done = $F \times s$

   $= 10 \times 5$

   $= 50$ J

Long Answer Questions

1. Mass = 2 kg

   Height = 10 m

   Potential energy = mgh

   $= 2 \times 10 \times 10$

   $= 200$ J

2. SI unit of energy is joule and the commercial unit of energy is killowatt-hour.

$$1 \text{ kWh} = 1 \text{ kW} \times 1 \text{ h}$$

$$= 1000 \text{ W} \times 60 \times 60 \text{ s}$$

$$= 1000 \frac{\text{J}}{\text{s}} \times 60 \times 60 \text{ s} \qquad (\text{since } 1 \text{ W} = \frac{1\text{J}}{1\text{s}})$$

$$1 \text{ kWh} = 3600000 \text{ J}$$

$$= 3.6 \times 10^6 \text{ J}$$

So the commercial unit of energy, i.e. 1 kWh is equivalent to 3.6×10^6 J.